REMARKS

Summary of the Office Action

Claims 1 and 3 are rejected under 35 U.S.C. § 102(b), as being anticipated by U.S. Patent No. 4,195,699 to Rogers et al. ("Rogers").

Claims 1 and 3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rogers in view of U.S. Patent No. 5,934,387 to Tuunanen ("Tuunanen").

Claims 2 and 4-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rogers in view of Tuunanen, and further in view of U.S. Patent No. 5,757,358 to Osga ("Osga").

Summary of the Response to the Office Action

This Preliminary Amendment is being filed concurrently with a Request for Continued Examination. In accordance with 37 C.F.R. § 1.114(c), it is respectfully submitted that this Preliminary Amendment meets the reply requirement of 37 C.F.R. § 1.111 with respect to the Final Office Action dated June 7, 2005, as will be discussed more fully below.

Applicant has added new claim 8.

Claims 1-8 are pending.

Summary of the Examiner Telephone Interviews

Applicants respectfully thank the Examiner for courtesies extended during the telephone interviews on December 1, 2005 and December 5, 2005, between Applicants' below-signed representative and the Examiner. During the interviews, Applicants asserted that Rogers discloses only one control mode- specifically a control mode to optimize a drilling penetration

rate. Applicants asserted that Rogers does not teach or suggest at least two simultaneously active control modes with different control strategies, as recited in claims 1 and 3. The Examiner disagreed, relying on the disclosure at col. 5, line 48 – col. 6, line 3, of Roger's for a showing of such claimed features.

All Claims Define Allowable Subject Matter

Applicants have added new claim 8. Claim 8 recites a method of controlling rock drilling, including adjusting at least one operating parameter of drilling to accomplish a desired control operation. The adjusting step includes providing an operating system of a control unit with at least two simultaneously active control modes with different control strategies. Each control mode determines at least one criterion to be measured during drilling, a threshold value for a measurement result, and at least one adjustable operating parameter. The at least two simultaneously active control modes are at least two of a control mode to optimize a penetration rate of drilling, a control mode to optimize the straightness of a drill hole, and a control mode to optimize the service life of drilling equipment. Support for claim 8 is provided at, for example, paragraphs 0021-0024 of Applicants' specification.

Applicants respectfully submit that the applied references do not teach or suggest the features of at least two simultaneously active control modes being at least two of a control mode to optimize a penetration rate of drilling, a control mode to optimize the straightness of a drill hole, and a control mode to optimize the service life of drilling equipment, as recited in claim 8. As described above, Rogers merely discloses one control mode- a control mode to optimize a drilling penetration rate.

Claims 1 and 3 are rejected under 35 U.S.C. § 102(b), as being anticipated Rogers. Applicants respectfully traverse the rejection under 35 U.S.C. § 102(b), of claims 1 and 3.

Claim 1 recites a method of controlling rock drilling, including adjusting at least one operating parameter of drilling to accomplish a desired control operation. The adjusting step includes providing an operating system of a control unit with at least two simultaneously active control modes with different control strategies. Each control mode determines at least one criterion to be measured during drilling, a threshold value for a measurement result, and at least one adjustable operating parameter. The adjusting step further includes prioritizing one control mode over the other control modes, and calculating, based on the measurement results, control values for the operating parameters to be adjusted in the control unit in order to automatically control the drilling such that the control strategy of the prioritized control mode is weighted relative to the other control modes.

Claim 3 recites a control system for a rock drilling apparatus, including an operating system for a control unit. The operating system includes at least two simultaneously active preformed control modes with different control strategies. Each control mode determines at least one criterion to be measured during the drilling, a threshold value for a measurement result, and at least one adjustable operating parameter, such that one control mode can be prioritized over the other control modes. The control unit is arranged to automatically adjust, based on the measurement results, the operating parameters determined by the control modes such that the drilling result according to the prioritized control mode is weighted over the other control modes.

In contrast, Rogers discloses a control system including two drilling parameters- namely drill thrust and drill speed. Applicant submits that drill thrust and drill speed are not control

modes of independent claims 1 and 3, which recite "control modes with different control strategies" and "each control mode determining at least one criterion to be measured during drilling, a threshold value for a measurement result, and at least one adjustable operating parameter." In Rogers, one single drilling parameter does not include any strategy for controlling drilling. Moreover, since the drill thrust and drill speed of Rogers are both adjustable drilling parameters, drill thrust and drill speed of Rogers do not also determine some other adjustable parameters.

The attached page of the New Oxford Dictionary of English defines the term "mode" as "a way or manner in which something occurs or is experienced, expressed or done," and further as "an option allowing a change in the method of operation of a device." This is what is meant by the terms of the present claims. The cited dictionary further defines the term "parameter" as "a numerical or other measurable factor forming one of a set that defines a system or sets the conditions of its operation." Pages 1 and 8 of Applicants' specification describe that the operation parameters of rock drilling may include impact pressure, feed pressure, feed flow, rotation pressure medium flow, rotation pressure, and flushing pressure and flow. Thrust (feed) and drill speed are also called drilling parameters in Rogers, consistent with the present application and the cited dictionary. Thus, the meaning of the terms "mode" and "parameter" are well known to one of ordinary skill in the art. Applicant submits that the Office Action's interpretation of these terms are not consistent with the proper meaning.

On pages 5 and 6 of Applicants' specification, examples of different control modes are presented. The control modes may include, for example, the drilling efficiency mode, quality mode, cost mode and optimization mode. However, in Rogers, only one control mode can be

found. See, for example, the "Summary of the invention" of Rogers at column 1. The strategy of this single mode is "optimizing the rate of penetration of a drill." Because Rogers emphasizes through the whole document the importance of this single strategy, it would be against the teaching of Rogers to use at least two simultaneously active control modes with different control strategies.

Since Rogers does not disclose at least two simultaneously active control modes, Rogers cannot disclose weighting the importance of one control mode by prioritizing it, and still keep the other control modes simultaneously active but having less influence to the control than the weighted control mode.

On the other hand, Rogers teaches that the variables drill speed and thrust have equal importance when optimizing the penetration rate. If thrust and drill speed were considered to be control modes as the Office Action suggests, Rogers would still not show the present invention, since Rogers does not disclose prioritizing of one of them over the other, but rather teaches that thrust and drill speed have equal importance.

Thus, Applicants respectfully submit that Rogers does not teach or suggest the features of control modes with different control strategies, wherein each control mode determines at least one criterion to be measured during the drilling, a threshold value for a measurement result, and at least one adjustable operating parameter, and one control mode can be prioritized over the other control modes, as recited in claims 1 and 3. Moreover, Applicants submit that Rogers does not teach or suggest the features of calculating, based on the measurement results, control values for the operating parameters to be adjusted in the control unit in order to automatically control the drilling such that the control strategy of the prioritized control mode is weighted relative to

the other control modes, as recited in claim 1; or a control unit that is arranged to automatically adjust, based on the measurement results, the operating parameters determined by the control modes such that the drilling result according to the prioritized control mode is weighted over the other control modes, as recited in claim 3. Accordingly, it is requested that the rejection under 35 U.S.C. § 102(b), of claims 1 and 3, be withdrawn.

Claims 1 and 3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rogers in view of Tuunanen. Applicants respectfully traverse the rejection under 35 U.S.C. § 103(a), of claims 1 and 3. Applicant submits that Tuunanen fails to overcome the above-described deficiencies of Rogers. Specifically, Tuunanen does not teach or suggest the features of control modes with different control strategies, wherein each control mode determines at least one criterion to be measured during the drilling, a threshold value for a measurement result, and at least one adjustable operating parameter, and one control mode can be prioritized over the other control modes, as recited in claims 1 and 3. Moreover, Tuunanen does not teach or suggest the features of calculating, based on the measurement results, control values for the operating parameters to be adjusted in the control unit in order to automatically control the drilling such that the control strategy of the prioritized control mode is weighted relative to the other control modes, as recited in claim 1; or a control unit that is arranged to automatically adjust, based on the measurement results, the operating parameters determined by the control modes such that the drilling result according to the prioritized control mode is weighted over the other control modes, as recited in claim 3. Accordingly, it is requested that the rejection under 35 U.S.C. § 103(a), of claims 1 and 3, be withdrawn.

Claims 2 and 4-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over

Rogers in view of Tuunanen, and further in view of Osga. Applicant submits that Osga fails to overcome the above-described deficiencies of Rogers and Tuunanen. Claim 2 depends from claim 1, and claims 4-7 depend from claim 3. The dependent claims recite the same combination of allowable features recited in the respective independent claims, as well as additional features that define over the prior art. For example, claim 4 is directed to weighting of control modes calculated depending on the distance to the control modes places in predetermined points. In contrast, Osga relates to a selection aid. In Osga, symbols/objects are presented in a computer display and the symbol/object lying closest to a cursor is visually indicated to a user before a selection is made. See column 4, lines 3-14 of Osga. The only teaching in Osga is to select the closest object. Moreover, in Osga, the symbols/objects may be positioned anywhere on the display screen. There is no indication in Osga to place the symbols/objects beforehand into a certain order, place or pattern. On the contrary, at column 1, line 66-67, Osga describes that the symbols represent real world objects. Therefore, if the place of the objects were modified from the place where they actually are, that would be manipulation of reality. Moreover, in Osga there is no operation area in the sense of claim 4, but rather Osga only teaches that every single independent symbol/object has an own selection area.

Accordingly, it is requested that the rejection under 35 U.S.C. § 103(a), of claims 2 and 4-7, be withdrawn.

CONCLUSION

Applicants respectfully submit that all pending claims are in condition for allowance, and a notice of such is earnestly solicited. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative to expedite the prosecution.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account 50-0573. This paragraph is intended to be a CONSTRUCTIVE PETITION FOR EXTENSION OF TIME in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

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